ELECTRICAL SAFETY

RHIC PROJECT

I. LOCKOUT/TAGOUT AND DEVIATING PROCEDURES

A. Lockout/Tagout procedures, in accordance with OPM 2.11, shall be used whenever possible when repair, maintenance or construction is performed on equipment that has the potential for energy release.

B. If Lockout/Tagout procedures cannot be used, then a hot work procedure and working hot permit, as approved by the Laboratory Electrical Safety Officer (LESO), shall be implemented.

II. PROJECT HOT WORK PROCEDURES AND PERMITS

A. Working hot procedures approved for this Project are located in the RHIC Operations Procedures Manual.

B. Completed Energized Work Permits are kept on file with the ES&H Coordinator.

III. NEW HOT WORK PROCEDURES

A. The Project shall develop a written procedure, use working hot permits, and train employees in accordance with BNL ES&H Standard 1.5.0, whenever hot work is to be performed.

B. At least 10 working days before implementing a major revision of a hot work procedure, the Project shall submit it to the LESO for review.

IV. TESTING WITH A "DEAD FRONT"

A test procedure of the following type will not constitute an exposure to a range B or C hazard, and therefore, may be performed without a "working hot" permit:

1. All hazardous voltages are deenergized and locked out or tagged out as described in BNL ES&H Standard 1.5.1.

2. All test instruments are attached or rearranged while the system is deenergized.

3. All doors and panels are installed and closed so as to constitute a safe "dead front" condition.

4. The system is unlocked or untagged and energized for observation and data taking preserving the "dead front" condition at all times.

5. The process is then reversed to recover the instruments.

V. CRITERIA FOR ISSUING A GENERIC "WORKING HOT" PERMIT FOR RANGE B HAZARDS

A range B (Medium Hazard) condition exists when it is possible for an employee to come in contact with an electrical circuit capable of delivering more than 10 milliamperes or 10 joules of stored energy and has a potential of falling between the following limits:

AC voltage	Greater than 50V but Less than 250V
DC voltage	Greater than 50V but less than 1000V

Within the clearance and distances stated in ES&H Standard 1.5.0 Table 2.

Authorized employees "working hot" must have at least a generic working hot permit. These permits will be issued by the Project Director or designee to an employee meeting the following conditions:

1. The employee receiving a generic working hot permit must have a recognized electrical background or equivalent electrical training.

2. Employees receiving this permit must have attended an annual safety training lecture which will describe the hazards in this voltage range and make clear the limits of this generic permit. This lecture will focus on the requirements of ES&H Standards 1.5.0 and 1.5.1.

3. The Project will maintain a list of all authorized employees qualified to hold generic "working hot" permits, review and reissue these permits upon request at intervals not to exceed one year.

4. All permits will list or otherwise identify the electrical components or component groups covered by the permit. Work will be limited to the items listed.

5. The Project will establish a Working Hot Oversight Committee to which all applications will be submitted. If a request is approved by a majority of this committee, the Project Director or designee may issue the requested permit. The Committee will review applications to see that all of the following requirements are met:

   A. The applicant has been certified by his/her supervisor or other designated person that he/she has been thoroughly instructed in the operation of the component or component group specified and is thoroughly instructed in all hazards contained therein. Records of this certification will be maintained.

   B. This panel will review the work requested to make sure that it must be done "hot". "Working hot" must constitute an exceptional situation, something that is done only for unavoidable reasons, never something that routinely reoccurs. Permits will not be approved if reasonable alternate non-hot procedures can be found.

   C. The planned supervisory oversight will be reviewed and certified to be adequate.

VI. CRITERIA FOR ISSUING A JOB SPECIFIC "WORKING HOT" PERMIT FOR RANGE C HAZARDS

A range C hazard condition exists when it is possible for an employee to come in contact with an electrical circuit capable of delivering more than 10 milliamperes or 10 joules of stored energy and have a potential of falling between the following limits:

AC voltages	Greater than 250V but less than 600V
DC voltages	Greater than 1000V but less than 6000V

Within the clearance and distances stated in ES&H Standard 1.5.0 Table 2.

Employees "working hot" must have a specific permit issued for the task to be performed. Permits issued for similar but different activity do not constitute a substitute for this required permit. It is expected that work in this hazard range (range C) will be permitted only under special and unusual circumstances.

These permits will be issued by the Project to an employee meeting the following conditions:

1. The employee receiving a range C working hot permit must have a recognized electrical background which must consist of at least two years of formal electrical schooling or the equivalent in electrical work experience.

2. Employees receiving this permit must have attended an annual safety orientation training lecture which will describe the hazards in this voltage class. This lecture will focus on the requirements of the Laboratory ES&H Standards 1.5.0 and 1.5.1.

3. The Project will maintain a list of all employees who, with specific permit in place, have been authorized to perform hot work in hazard range C. This list will be reviewed by the issuing committee at intervals not to exceed one year. The permit may be reissued if the need for same remains.

4. All permits will list or otherwise identify the electrical component or component group covered by the permit and the supervisory control to be executed. Work will be limited to the items listed and conditions specified.

A task requiring an employee to work under this range of hazard must meet the following conditions:

1. The work or information to be obtained while exposing an employee to a range C hazard must be necessary to repair or troubleshoot the Project systems.

2. After careful thought and consultation, no alternate method or procedure can be devised which will accomplish the task and avoid the exposure of personnel to range C hazards. Convenience, work expedience and time saving are NOT acceptable justification for exposing employees to hazards of this class.

3. Knowledgeable and adequately trained personnel are available and capable of performing the required task.

Permits for exposure to range C hazard are obtained by the following procedure:

Any person desiring a range C "Working Hot" permit must submit through his/her supervisor a request for this permit in writing to the Project Working Hot Oversight Committee. This request must state the need for this unusual type of work and the reason the assigned mission cannot proceed without it. The request must also state that NO alternate method that avoids exposure to range C hazards can be found and list those consulted who concur in this finding.

The request must contain a step by step description of the method and procedure to be used including all supervision required. This procedure must be designed so as to minimize the exposure to hazard and thus reduce the chance of accident. Again, convenience and time saving must not be traded for safety.

A request will be reviewed by the Working Hot Oversight Committee appointed by the Project Director. If a request is approved by this committee, the Project Director or his designee may issue the requested permit. This panel will review applications to see that all of the following conditions are met:

A. The applicant has been certified by his supervisor or other designated person that he/she is a recognized expert or has been thoroughly instructed in the operation of the component or component group specified and is thoroughly instructed in all hazards contained therein. Records of this certification will be maintained.

B. This panel will review the work requested to make sure that it must be done "hot". "Working hot" must constitute an exceptional situation, something that is done only for a few unavoidable reasons, and these systems are those whose malfunction may put at risk life, limb or vital equipment. Permits will not be approved, if reasonable alternate non-hot procedures can be found.

C. The planned supervisory oversight will be reviewed and certified to be adequate.

D. Requirements/specifications of the working hot operation shall be defined on the permit; e.g., two-person rule, etc.

VII. CRITICAL SYSTEMS

The Project may identify certain systems as "critical". Work on these systems may be performed without the formal documentation described herein. In all cases this work will be performed by authorized personnel under proper supervision. The Project will maintain a list of qualified individuals for each "critical" system. RHIC does not have any critical systems at this time.

VIII. TRAINING

A. The ES&H Coordinator shall obtain training records and schedules for future training.

B. The ES&H Coordinator shall schedule training and maintain training records.

C. Line Supervisors shall ensure that their employees involved in hot work are current with appropriate training.

IX. RECALL OF PERMITS

The Project reserves the right to recall any type of permit for any reason. The following is a listing of some of the conditions which will result in permit recall:

1. Failure to attend any scheduled safety lecture or other training activity without adequate excuse.

2. Failure to attend retraining safety lectures for more than one year.

3. Any reported and verified violation of the electrical safety requirements.

Satoshi Ozaki 3/13/98

APPROVED _____ **DATE** _____

RHIC Project Director